REMARKS

Claims 1-8, as amended, are pending for the Examiner's review and consideration. Claim 1 has been amended to correct informalities and to recite that the metal ions in the metal compounds contained in the paste are diffused into the glass substrate as at least one of Li^+ ions, K^+ ions, Rb^+ ions, Cs^+ ions, Ag^+ ions, and Tl^+ ions, by ion exchange with the alkali metal component of the glass substrate. Support for this amendment can be found in the specification at page 8, line 35 to page 9, line 4. As this amendment does not introduce any new matter into the present application, its entry at this time is warranted. The applicants respectfully request reconsideration and allowance of this application in view of the above amendments and the following remarks.

In the office action, the Examiner noted that the U.S. Patent Office had not yet received a certified copy of the priority document, JP2004-44734, from the International Bureau. The applicants note that the priority document is on electronic file at the International Bureau and should have been forwarded to the U.S. receiving office. On 17 November 2008, a PCT Legal representative confirmed to the undersigned that a copy of the certified copy of the priority document would be scanned into the U.S. Patent Office's system and made available to the Examiner. The applicants respectfully request that the Examiner confirm receipt of priority document, JP2004-44734, on the next office action. If the Examiner requires a certified copy of the priority document, he is invited to contact the undersigned by telephone.

Claim 1 was objected to due to informalities as indicated in paragraph 4 of the Office Action. It was asserted that the sequence "and thallium compounds, an organic resin, and an organic solvent" should use semi-colons instead of commas. Claim 1 has been amended in accordance with the Examiner's suggestion, correcting the noted informalities; therefore, this objection should be withdrawn.

Claims 1-8 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent no. 3,997,312 to Besselink for the reasons given in paragraph 6 of the Office Action. It was asserted that Besselink discloses all of the elements of these claims. The applicants assert that this rejection has been overcome and respectfully request that this rejection be withdrawn for the following reasons.

Claim 1, which is the only independent claim, recites a method of producing an optical element, comprising applying a paste containing at least one compound selected from lithium compounds, potassium compounds, rubidium compounds, cesium compounds, silver compounds, and thallium compounds; an organic resin; and an organic solvent to a glass substrate containing an alkali metal component as a glass component and then performing heat treatment at a temperature below the softening temperature of the glass substrate. The metal ions in the metal compounds contained in the paste are diffused into the glass substrate as Li^+ ions, K^+ ions, Rb^+ ions, Cs^+ ions, Ag^+ ions, and Tl^+ ions by ion exchange with an alkali metal component of the glass substrate.

The optical element production method, as recited in the pending claims, thus applies a paste to a glass substrate and performs a heat treatment to exchange metal ions contained in the paste with an alkaline component of the glass substrate. More specifically, monovalent cations (Li^+, K^+, Rb^+, Cs^+, Ag^+, Tl^+) are diffused into a glass substrate by ion exchange to produce a continuous refractive index distribution according to the change in diffuse density. The portions of the glass substrate where the monovalent cations are diffused have refractive indices different from those of the surrounding portions of the glass substrate; however, all portions of the glass substrate have the same transmittance. More specifically, the portions where the monovalent cations are diffused have the same color as the surrounding portions of the glass substrate, and the monovalent cations do not act as a coloring agent for the glass substrate.

By contrast, Besselink is direct to a method of manufacturing colored pressed glass articles such that the formation of aesthetically unacceptable stripes and patches is avoided. These stripes and patches are known to occur on the surface of conventional colored glass articles. According to Besselink a pressed glass article (before the glass article is subjected to a staining treatment) is dipped in an etching liquid containing hydrofluoric acid to remove a glass surface layer at least 10 μm in thickness by etching. This etching process provides complete avoidance of stripes and patches forming on the surface (Besselink, column 1, lines 40 to 48). After etching, the glass is colored. Besselink describes the indiffusion of silver ions as a method for coloring the glass and mentions silver sulphate, silver chloride, silver oxide, silver sulphide, etc. as silver sources. Silver sulphate is used in the illustrated Example (Besselink, column 1, lines 14 to 23, and Example). In addition, Besselink describes producing a red color by indiffusion of silver ions and discloses that other colors are obtainable by indiffusion of other ions, for example copper ions (Besselink, column 1, lines 29 to 31).

According to claim 1 of the present invention, monovalent cations (Li^+, K^+, Rb^+, Cs^+, Ag^+, Tl^+) are diffused into a glass substrate by ion exchange to produce a continuous refractive index distribution in accordance with the change in diffuse density. These monovalent cations form a continuous refractive index distribution in a glass substrate but do not color the glass. According to Besselink, the object of the invention is to provide colored glass articles, and silver ions are used as a means for coloring the glass. Besselink does not include any disclosure or discussion of monovalent cations. Since monovalent silver ions (Ag^+ ions) do not color glass, Besselink cannot be using monovalent cations. In fact, Besselink is most likely to be using clusters of Ag^0 , and these clusters are diffused into the glass in the method of Besselink.

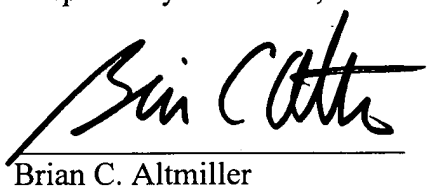
Therefore, monovalent cations are diffused into a glass substrate in the present invention, and clusters of Ag^0 are diffused into the glass in Besselink. Besselink nowhere describes or

suggests diffusing monovalent cations into a glass substrate to form a continuous refractive index distribution according to the diffuse density. Therefore, Besselink fails to teach or disclose all of the elements of the present invention as currently recited in claim 1. The remaining claims depend either directly or indirectly from claim 1 and include additional recitations that further define the present invention over Besselink. Therefore, the applicants assert that this rejection has been overcome and respectfully request that it be reconsidered and withdrawn.

In view of the foregoing, the applicants submit that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions relating to patentability remain, the examiner is invited to contact the undersigned by telephone.

If there are any problems with the payment of fees, please charge any underpayments and credit any overpayments to Deposit Account No. 50-1147.

Respectfully submitted,



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